

**WHAT IS CLAIMED IS:**

1. A cardioprotective composition characterized in that it comprises a therapeutically effective amount of a mixture of pyruvate, at least one  
5 antioxidant, at least one lipid and ceruloplasmin and/or a functional derivative thereof.
2. The cardioprotective composition of claim 1, wherein said pyruvate, antioxidant, lipid and ceruloplasmin are present in an amount that have a  
10 synergistic cardioprotective effect on cardiac cells.
3. The cardioprotective composition of claim 1, wherein said at least one lipid consists of at least one fatty acid selected from the group consisting of monoglycerides, diglycerides, triglycerides, free fatty acids, and mixtures  
15 thereof.
4. The cardioprotective composition of claim 3, wherein said at least one fatty acid consist of a mixture of saturated and unsaturated fatty acids.
- 20 5. The cardioprotective composition of claim 4, wherein said fatty acids are present in an amount varying from about 0.001% v/v to about 1% v/v, by weight of the cardioprotective composition.
6. The cardioprotective composition of claim 1, wherein ceruloplasmin or its  
25 functional derivative is purified from blood using an one-step affinity chromatography on aminoethyl-agarose.
7. The cardioprotective composition of claim 1, wherein ceruloplasmin or its  
30 functional derivative is present in an in an amount varying from about 0.05  $\mu$ M to about 10  $\mu$ M.

8. The cardioprotective composition of claim 1, wherein pyruvate is selected from the group consisting of pyruvic acid, pharmaceutically acceptable salts of pyruvic acid, prodrugs of pyruvic acid, and mixtures thereof.
- 5 9. The cardioprotective composition of claim 1, wherein pyruvate is present in said composition in an amount varying from about 0.01 mM to about 100 mM.
- 10 10. The cardioprotective composition of claim 1, wherein said at least one antioxidant is selected from lipid-soluble antioxidants.
11. The cardioprotective composition of claim 1, wherein said at least one antioxidant is selected from the group consisting of Vitamin A, carotene, Vitamin E, pharmaceutically acceptable salts thereof, and mixtures thereof.
- 15 12. The cardioprotective composition of claim 1, wherein said at least one antioxidant is selected from the group consisting of Vitamin E, Vitamin E acetate and analogues of Vitamin E.
- 20 13. The cardioprotective composition of claim 1, wherein said at least one antioxidant is present in an amount varying from about 0.01 unit/ml to about 10 unit/ml of said composition.
- 25 14. The cardioprotective composition of claim 1, wherein it further comprises an agent selected from the group consisting of metal chelators, metal scavengers, proteinic metal chelators, proteinic scavengers, preserving agents, solubilizing agents, stabilizing agents, wetting agents, emulsifiers, salts, buffers and coating agents.
- 30 15. A method for treating a heart oxidative stress related condition comprising the administration to a patient in need thereof of a therapeutically effective amount of an antioxidative composition comprising pyruvate, at least one

antioxidant, at least one lipid and ceruloplasmin and/or a functional derivative thereof.

16. A method for treating a heart oxidative stress related condition comprising:
- 5 - administering to a patient in need thereof of a therapeutically effective amount of an antioxidative composition comprising: pyruvate, at least one antioxidant and ceruloplasmin and/or a functional derivative thereof; and
- providing into blood circulation of said patient at least one lipid having a synergistic therapeutic effect on cardiac cells in combination with said
- 10 antioxidative composition.
17. The method of claim 16, wherein said at least one lipid is provided to said patient by increasing its lipidic blood level ratio through its diet.
- 15 18. The method of claim 16, wherein said heart oxidative stress related condition is an heart attack/failure, ischemic cardiopathy, or handling an heart before and during an heart transplantation.
19. A method for the treatment of cardiac cells, comprising contacting said cells with a therapeutically effective amount of an antioxidative composition comprising pyruvate, at least one antioxidant, at least one lipid and ceruloplasmin and/or a functional derivative thereof.
- 20 20. The method of claim 19, for protecting cardiac cells *in vitro*, *in vivo* and *ex vivo* against an oxidative stress related condition.
- 25 21. The method of claim 19, for the treatment of heart attack/failure, the treatment of ischemic cardiopathy, the conservation of heart before and during transplantation, or the treatment heart oxidative stress related condition(s).
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22. A method for preparing a cardioprotective composition, comprising the steps of:

- a) providing a therapeutically effective amount of i) pyruvate, ii) at least one antioxidant, iii) at least one lipid, and iv) ceruloplasmin and/or a functional derivative thereof; and
- b) mixing together the components i), ii), iii) and iv) of step a) in a physiological buffered saline solution to obtain a homologous pharmaceutically acceptable suspension.

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